

# San Francisco Bay Conservation and Development Commission

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November 30, 2018

**TO:** All Commissioners and Alternates

**FROM:** Lawrence J. Goldzband, Executive Director (415/352-3653; [larry.goldzband@bcdc.ca.gov](mailto:larry.goldzband@bcdc.ca.gov))  
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**SUBJECT: Draft Minutes of November 15, 2018 Commission Meeting**

1. **Call to Order.** The meeting was called to order by Chair Wasserman at the Bay Area Metro Center, 375 Beale Street, Yerba Buena Room, First Floor, San Francisco, California at 1:08 p.m.

2. **Roll Call.** Present were: Chair Wasserman, Vice Chair Halsted, Commissioners Addiego, Ahn, Bottoms, Butt, Chan (represented by Alternate Gilmore), Cortese (represented by Alternate Scharff), Gorin (departed at 3:16 p.m.), Jahns (represented by Alternate Eckerle), McGrath, Pine, Ranchod (represented by Alternate Nelson), Sears, Showalter, Spering (represented by Alternate Vasquez), Tavares (represented by Alternate McElhinney), Techel (departed at 2:55 p.m.), Wagenknecht (departed at 2:58 p.m.) and Zwissler.

Chair Wasserman announced that a quorum was present.

Not present were Commissioners: Senate Rules Committee (Alvarado), Department of Finance (Finn), Contra Costa County (Gioia), Governor (Randolph), State Lands Commission (Lucchesi), City and County of San Francisco (Peskin), U.S. Environmental Protection Agency (Ziegler).

3. **Public Comment Period.** Chair Wasserman called for public comment on subjects that were not on the agenda.

John Coleman of the Bay Planning Coalition addressed the Commission: I want to start off by thanking Brad McCrea for helping facilitate the Josh Berman update on the marinas in terms of what is happening in the San Francisco Bay.

We have our annual meeting on December 7th at the City Club in San Francisco. We have a reception first and following that we have our lunch meeting. We have two speakers and one of them is Chair Wasserman and the other one is Executive Director Goldzband.

They are going to talk about the Bay Plan amendments. They are going to be introducing this to the business community many of the stakeholders who need to get a clear understanding of where BCDC is going and why it is being done and what the implications are.

**BCDC MINUTES**

**November 15, 2018**

We would love to have you attend as well. What I am trying to do at the Bay Planning Coalition is to make sure that the business community, the stakeholders understand what you are doing, where you are going, why you are doing it in order to be supportive and not have kickback later saying, what is happening, why are you doing this; we don't like it. And that is counter-productive for everybody. So, we are trying to be proactive. We hope you will be able to attend. Thank you.

Chair Wasserman moved to Approval of the Minutes.

**4. Approval of Minutes of the November 1, 2018 Meeting.** Chair Wasserman asked for a motion and a second to adopt the minutes of November 1, 2018.

**MOTION:** Commissioner Gilmore moved approval of the Minutes, seconded by Vice Chair Halsted.

**VOTE:** The motion carried with a vote of 18-0-2 with Commissioners Addiego, Ahn, Butt, Gilmore, Scharff, McElhinney, Eckerle, McGrath, Pine, Nelson, Sears, Showalter, Vasquez, Techel, Wagenknecht, Zwissler, Vice Chair Halsted and Chair Wasserman voting, "YES", no "NO", votes and two abstentions, Commissioners Bottoms and Gorin.

**5. Report of the Chair. Chair Wasserman reported on the following:**

a. Today and the last few days are clearly a demonstration of the perilous times that we are in and the dangers that we are caught between; the dangers of rising sea level that we try to deal with on a frequent basis.

And obviously the fires: and one of the difficulties is the immense stress on our resources to deal with fire - fighting but also with the damage and the tragedy of the loss of life for which no resources can help.

The bottom line is we just need to keep soldiering on and as discouraging as it sometimes seems we just need to keep working on what we are working on. This work must continue on the regulatory side and the planning side.

The danger of climate change continues and our work needs to speed up even more.

b. I would now like to ask Commissioner Nelson to report on the Fill for Habitat Workgroup meeting that was held this morning.

Commissioner Nelson addressed the meeting attendees: The work of the Working Group is going to be our agenda later so we had a terrific conversation this morning. We are going to have a conversation about that shortly. We are going to meet again on December 20th.

Most of our conversation this morning was about the work plan and process that staff will present shortly. On December 20th we are reconvene and dive more deeply into the substance so we can get a jumpstart on the New Year to make sure that, as we get into real, meaty part of this work talking about where we need to need to make changes in the Bay Plan and potentially the McAteer-Petris Act. We will move that process along as fast as we can.

I will have more for you later.

Chair Wasserman asked: Any questions about that? (No questions were voiced)

c. **Next BCDC Meeting.** Our next meeting will be on December 6th when we will likely:

(1) Hold a public hearing and vote on a proposed East Bay Regional Park District project at Bay Point.

(2) Hold a public hearing and vote on the Golden Gate Transit District's bridge suicide barrier.

(3) Hold a closed session on Westpoint Harbor.

(4) Consider and possibly vote on the Enforcement Committee's Recommended Enforcement Decision on Westpoint Harbor.

(5) Have a staff briefing on the Environmental Justice Bay Plan amendment.

Keep it on your calendars but we probably will not have a Commission meeting on December 20th and we will confirm that as soon as we can.

d. **Ex-Parte Communications.** Now is the time to verbally report any ex-parte communications if you wish to do so. You only have to do so on adjudicatory matters not on policy or planning matters. And you need to do it in writing whether you do it verbally or not. Any reports? (No ex-parte communications were reported)

**6. Report of the Executive Director.** Executive Director Goldzband reported the following: Thank you very much Chair Wasserman.

I want to take just a minute and wish all of you a very happy and festive Thanksgiving. I hope that you spend it with people you love, or at least like, (Laughter) and that we all think at some point of those in California whose lives have been totally upended during the past year due to wildfires, mass shootings, and whatever other horrible chaos has ensued.

a. **Policy.** I'd like to ask a couple of our staff members to bring you up to date on two very important issues. First, I'd like Brenda Goeden to explain BCDC's latest actions regarding the U.S. Army Corps of Engineers and the Port of Oakland's Middle Harbor Enhancement project. And you have in front of you a letter to the Corps to which Brenda will refer.

Sediment Program Manager Goeden addressed the Commission: I am going to briefly bring you up to speed on the Middle Harbor Enhancement Project. I want to give you two prefaces: This permit/consistency determination was issued in 2000 and I was not the analyst on it. I have been working on the project for quite a while though, but if I don't have an answer for you today on question, I will get back to you. Secondly, most of the enforcement work has been done by Schuyler Olsson of our enforcement staff. He has been working very hard on this, to the enforcement team's credit, I am giving the presentation because he is on vacation.

I will give you a little background about the project , the status of where it is today, and then I will then touch on the letter to the US Army Corps of Engineers that you have in front of you today. Commissioner McGrath also has plenty of history on this particular project so he may help me out from time to time.

As part of the Port of Oakland's 50-foot, deepening project there were approximately 17 million cubic yards of sediment to be generated. The potential was to dispose of the sediment out in the deep-ocean disposal site. Clearly the in-Bay, disposal sites would not able to handle the 17 million cubic yards of material generated by this project. Through discussions and negotiations between the environmental community, the Port, the USACE, BCDC, the LTMS partners, and stakeholders, the material was sent to three locations: Middle Harbor Enhancement Project, Hamilton Wetlands Restoration Project and Montezuma Wetlands Restoration Project. The project was authorized in two ways. Because it is primarily an Army Corps of Engineers project, 75 percent cost-share – construction of the site was issued through a federal consistency determination. Along with that, because the Port of Oakland is the local project sponsor with a 25 percent cost-share, we issued a permit to the Port, but the permit is primarily for the maintenance and monitoring of the project once it is completed.

It is important to note that in the 2000s, BCDC did not have the ability to condition consistency determinations. That means the federal entity can propose a project, do their best to meet our laws and policies to the maximum extent practicable and the Commission could agree or object. Staff worked diligently with the Port of Oakland and the Army Corps of Engineers to incorporate all the things we wanted to see in the project, but the consistency determination does not have conditions in it.

You see here that the goal of the Middle Harbor Enhancement Project was to restore what was historically shallow-water habitat to a mosaic of shallow-water eelgrass beds, shallow flats, deep-water channel basins, sandy beaches, hard-bottom, coastal, salt marsh and high-tide refugia for birds and some buffer areas for public access. Overall, the site is 180 acres in size and the volume of sediment that was placed at the site was 5.8 million cubic yards. Here you see the project location, just south of the Bay Bridge and Treasure Island. And Middle Harbor is in the middle of Port of Oakland inner and outer channels reaching out into the Bay.

This slide shows you what the site looked like in the 1930s. Folks may recall that the site was used by the Navy and they had berthed their ships here. It was dredged down to a depth of minus 42 feet, much deeper than the historically, shallow-water habitat. The proposal was to place the dredged material in deeper area and bring it up to shallow-water habitat. Here you see the conceptual design. The light-blue fingers are the shallower-water area that were for eelgrass beds, or suitable for eelgrass habitat. Fifteen acres of it were to be planted. The darker-blue fish bones going up between the fingers are slightly, deeper-water channels which bring water up and circulate into the project.

In order to place the dredged material, which is kind of sloppy when you dredge it, a jetty was put in place to hold the sediment this area while it consolidated. Some of the jetty was above water, but most of it was below water. A small marsh was to be created as an educational component at the request of the East Oakland Community. In addition, a public a public-access beach was also developed, and a series of rock islands placed in this area to take care of our avian friends. By the way, these slides and graphics are from the Port of Oakland and the Army Corps of Engineers, I did not create them, so they should be given credit.

As of the middle of last year most of this was completed. The Corps had placed 5.8 million cubic yards of dredged material in the area. They had to wait a period of time to allow the sediment to settle and consolidate before they could work with it. Once that was done in 2016, they completed the final sculpting of the sediment. They moved another 400,000 cubic yards of sediment around within the site to create those fingers and herring bone patterns suitable for eelgrass planting. They took down that rock jetty to the extent that was planned, left a portion of it in place. And they moved the pieces of the rock jetty around to create avian islands. In doing that they opened the site to full, tidal circulation. They have constructed the marsh to the extent that it was planned for educational purposes. This is what the site looks like now from an aerial view. This graphic shows the small dredge that was up in the corner here and they were moving sediment up around into these different areas. It is an interesting construction view.

The current schedule is that by the end of this year they should have completed their habitat, suitability evaluation, and warranty period. In 2019, they will be planting the first phase of eelgrass. It is to be planted in two phases. The first phase is to make sure that it is taking well and then the second planting would happen in 2021. And then by 2022 we would expect the project to be fully complete and the 10-year monitoring, adaptive-management period to begin.

In 2014 David Lewis from Save the Bay came to the Commission and presented the Commission with concerns about this project. The project was initially to be constructed in a fairly, short, period of time. There were criteria that were set forth for construction. And a number of things happened such that the construction did not take place as planned. The 50-

foot dredging of the navigation channels, the inner/outer and entrance channels of Oakland Harbor had been completed. The material had been placed but there was not much movement in the eelgrass planting and other habitat benefits that had been committed to and that very much concerned David Lewis with Save the Bay, and others including the Audubon Society.

As a result of Save the Bay's concerns, we did a review of the project. We began coordinating more in earnest with the Army Corps and the Port of Oakland, got them to reconvene their Technical Advisory Committee, and pushed them to move the stalled project forward. David came back to us in 2015 and 2016 still expressing concerns that the project was not moving fast enough. The Commission directed staff to look into this issue and to work to resolve it. That is where Schuyler comes into the picture. I had been working on the project coordination side, and he opened an enforcement investigation, and worked with our legal counsel to determine what remedies the Commission has available. He worked through the file and looked at the documents that had been submitted and found that the project, depending on where you started counting, as the dredging portion of the project being complete, MHEA completion is approximately 14 years behind schedule.

There are some reasons for this that we understand to be valid and important. Federal funding did not come as anticipated for some of the work. There were also issues with the sequence of the dredging. It happened a little bit differently than what was planned. The idea was that more sand would go into the site needing less time for consolidation. But it got mixed between sand and mud so we actually saw more mud in the site than we had anticipated. This meant the site took longer to consolidate than anticipated. As part of David's concerns that we were in agreement with was that the habitat benefits that had been promised were not provided in the timeframe that was committed to and that this should be remedied.

As part of the federal consistency, determination process we have some very, basic opportunities to ask for remedial action from the Corps. If they do not comply with the remedial action request, we can ask NOAA to mediate a remedy. And, of course, our final, potential option is always a lawsuit; none of which is very, much fun. So, Schuyler worked very hard in drafting the letter that you have before you requesting remedial action. We sent it about a week ago to the Army Corps of Engineers. It requests four different areas of remedies. The first is eelgrass planting.

The Army Corps had committed to planting 15 acres of eelgrass on the site and having 110 acres of habitat suitable for eelgrass to expand into overtime. Schuyler worked with Kathy Boyer of the San Francisco State University at Tiburon to determine what expansion rate had taken place with eelgrass around the Bay given some of the variation in temperature and fresh water that causes some expansion and contraction of eelgrass and determined that we would have expected to see at least another 3.4 acres of eelgrass expansion during that time in this area. We have asked the Army Corps of Engineers to plant approximately 3.4 more acres of eelgrass. That would bring us up to about 18.5 acres of planted eelgrass.

The second item was the educational marsh. It is an educational marsh instead of just a marsh because in working with the West Oakland Community as part of the development of this project, they had told the Commission and the project sponsors that they could have public access around the shoreline but what they would really like was an example of habitat that they could bring students and the community out to. This would help people understand what a marsh is like because there is not a lot of marsh nearby in these communities. The project was committed to develop an educational marsh; something that would be a demonstration not necessarily a large, habitat piece. Unfortunately, at least in this point of the development of the project, there was not enough sediment placed in this area to bring it to marsh plain elevation and there was no commitment to plant it with any vegetation. In the letter we have asked the Corps to raise the elevation appropriate to marsh vegetation and to plant it to make up for the lost time that this marsh would have developed.

The third item we have asked them to look at the issue of the rock islands. This part is a little bit less clear for staff. There is definitely a maximum acreage or rock islands that were to be created and a minimum. And what has been created is in the range of what was expected but in a much smaller degree. There is another issue which is resolvable in that the initial placement of the rocks started to settle because you are putting something heavy on soft sediment. So, it started to settle. So, we have asked the Corps to propose a remedy here. The push/pull with this particular part of the project is if we were to expand the rock islands, we would be asking them to put more fill in the Bay but it would be for the purpose of providing habitat. So, there is a little bit of a push/pull there.

Those are the three items we laid out for the Army Corps of Engineers. We did give them some advance notice that this was coming and they are in the receipt of the request and we are waiting to hear their response. They've committed to providing a response to us by February.

If one were to ask whether there is any habitat provided, we'd answer that we do believe that there is interim habitat that is there. There are birds that come out and use the site. There are fish swimming around eating. We are not to say that there is no habitat at this site. We do know that there is shallow water available but there were specific items that were committed to by the Corps and the Port that have not yet been delivered and are significantly delayed, that is why we asked for the remedial action.

The other piece, which we don't have before you yet today is that we will be asking the Port of Oakland for a similar proposal on how to fix the beach because the beach is not quite functioning as a public-access beach as anticipated. The Port is also aware of the letter, but we will probably be sending that out sometime next week or the following week. That is as quickly as I can talk about Middle Harbor Enhancement Project. I will take questions if there are any. (No questions were voiced)

Commissioner Nelson commented: When this project was originally approved it was approved very much as an experiment. It was a project we believed would succeed but it was approved as an experiment. And Bay Fill Policy 11 says basically, we are going to wait until this project succeeds before we do anything else like it. Since then we have started wrestling seriously with sea level rise. And we know that we need to do more projects, not specifically like this, but we need to do more habitat restoration projects using Bay fill. This is by far the largest Bay-fill, habitat-restoration project we have ever approved. We know that we need to do more. I wanted to connect the dots here. When we get to the discussion about Bay fill shortly it very much is revolving around this issue. And one of the Bay Plan amendments that we are going to want to think about is; what do we do about Dredge Fill Policy 11? On the one hand we want to make sure that we are able to approve more successful, habitat, restoration projects but on the other hand we also want to learn from this project and make sure that we learn from its successes and learn from the mistakes. That is a non-trivial, balancing act that we are going to be wrestling with as a working group as a staff and as a Commission.

Ms. Goeden added: I was a little remiss in not mentioning this; as part of the negotiations in the late 1990s and the early 2000s we had to amend the Bay Plan specifically to allow this project to go forward. And this is very much part of the rub with Save the Bay and the Audubon Society. They put out their political chips to support this project and to help us work this through the Bay Plan Amendment. And they feel very much that they need to get the benefits that they had committed to the environmental community.

Commissioner Zwissler had questions: I am glad you put this picture up because it shows that it actually is a really, cool site. I have been there recently. While we bemoan not completing a lot of stuff that needs to get completed, we need to also recognize there is some really, good stuff there. Do you have any data or any information on how much it is used by humans? Do we even care? Do we track that? Ms. Goeden answered: I do not have that information. I don't know if the Port of Oakland would. But the public-access portion of this project is actually a separate permit to the Port of Oakland. It is a little complicated but because of the berth deepening, but the public access for the shoreline project was required as part of that project's permit, which is different than the federal channeling deepening even though they are linked. Executive Director Goldzband commented: And with regard to terminology the Park is called Middle Harbor Shoreline Park. And the water area and the restoration is the Middle Harbor Enhancement Area.

Commissioner McElhinney was recognized: My question is about the eelgrass habitat. I have had a lot of great experience protecting eelgrass habitat as Caltrans and BCDC have worked together to build a new, Bay Bridge and demolish the old, Bay Bridge. Over the last year and a half some new, eelgrass habitat has been cropping up. I was wondering in regard to the eelgrass habitat locations; was eelgrass planted? Did eelgrass grow? What was the progress on eelgrass on the habitat areas that have been added for Middle Harbor? Ms. Goeden replied: There has been a pilot planting as of fall of 2017. There were 19 pilots put in and they did better than expected. Keith Merckel, the consultant who is the foremost eelgrass

## **BCDC MINUTES**

**November 15, 2018**



expert in the region is part of the team. As part of the development of the next for the first, full planting phase, he put test eelgrass plots in areas where he expected it to grow and in areas where he didn't expect it to grow to see how the conditions for these plants were. There is a specific combination of temperature, dissolved oxygen, clarity of the water that is suitable eelgrass to grow. Some of those pilot plots actually worked which is a good indicator that the full planting would go well, even though the pilot plots were planted at the worst time of year. The first phase of planting would happen this coming spring.

Chair Wasserman commented: I appreciate that this is a complex issue. I appreciate that we have very, limited control over federal funding which is a significant part of the delay. Having said that, as a matter of good faith and laying the groundwork for the changes that we are going to have to make in some of the Bay Fill Policy; we should outline as clear a path to whatever enforcement we can do if the Corps can't find a solution to this. I don't like litigation any more than anybody else but I don't want to be in a situation where we are delaying further using our best efforts to compel the Corps, and to the extent necessary the Port, although I think that is much less of a problem, to fulfill the obligations. Having said that, and I appreciate that the balance is a hard one; we can't wait a whole lot longer to learn these lessons to do our next projects. We need to learn what we can and start moving forward. Rising sea level will not let us delay anymore.

Executive Director Goldzband chimed in: We didn't plan this to be a cap on the Corps day. I will say that to Dr. Bottoms. I do want to ask Marc Zeppetello, our Chief Counsel, to give you a brief outline of the schedule that has finally been published as we go forward in the BCDC versus U.S. Army Corps of Engineers lawsuit regarding beneficial, reuse of dredged sediment and the Federal Standard.

Chief Counsel Marc Zeppetello addressed the Commission: I will give a brief summary of the procedural history of this case which was filed over two years ago in September of 2016 just to lead up to where we are today.

The Commission filed a suit against the Corps for failure to comply with certain conditions that the Commission imposed in concurring on a consistency determination for operation, maintenance dredging of the federal, navigation channels for 2015 to 2017.

The conditions related to maximizing beneficial reuse of dredged material and also reducing the use of hydraulic dredging to only one channel per year. The underlying legal issues related to the Coastal Zone Management Act, the Clean Water Act and certain Corps of Engineers' regulations for dredging including a regulation known as the Federal Standard which provides that the Corps gets to select what it views as the least-costly, environmentally-protective alternative for sediment disposal.

The first six months of the case was spent primarily on pleadings. The federal government answered about the same time BayKeeper moved to intervene in the case on the side of BCDC and at about the same time in January of 2017 the Corps announced that it was going to implement a new process of only alternate dredging of the Pinole Channel and the Outer Richmond Channel in alternate years with a hydraulic dredge.

The government argued that this new decision mooted that BayKeeper should not be allowed to intervene for that reason because the Corps was complying with the condition of only dredging one channel a year with a hydraulic dredge.

The Court didn't get into those issues and granted the motion to intervene by BayKeeper. The federal government argued to us that this mooted BCDC's claim on that issue. We respectfully disagreed and filed an amended complaint. The federal government filed an amended answer.

That got us to the spring of 2017. And then we spent about a year and a half going back and forth on agreeing on an administrative record. And that is what we recently completed.

There were many meet-and-confer discussions. Eventually BCDC and BayKeeper filed a motion to supplement the record. As a result of that ultimately the Corps added the majority of the additional documents that we wanted in the record.

At the end of October, we reached agreement on the record. The Corps has filed a supplemental record. And then the parties submitted a stipulation and a proposed order on a briefing schedule on the merits of the case.

Both sides are going to be filing motions for summary judgement which the premise is that the facts are not in dispute and the Court should rule as a matter of law for one side or the other.

BCDC and the BayKeeper will be filing their opening brief on January 18th of next year. The federal government will file its opposition in March. We get one more brief in April. The federal government gets a final brief in May and the oral argument is scheduled for May 30th of next year or soon thereafter as the Court will schedule.

We are finally getting to the merits of this case and is likely that by June, barring the unexpected, we will have a decision from the federal District Court on the merits of the case. Thank you.

Executive Director Goldzband asked: Any questions? The wheels of justice move slowly.

Commissioner Vasquez asked: What happened to the three-year permit? Do they have to come back for another one?

Chief Counsel Zeppetello answered: Well, in fact, they did. They came back for a new consistency determination and that was issued early this year. We agreed to disagree in that proceeding so they are reserving their rights and we've got the same conditions in that consistency determination and they are not complying from our point of view.

Executive Director Goldzband added: So, nothing has changed.

So, finally, please make sure that you complete your ethics training by year's end and that you provide Reggie with the confirmation that you have done so. At this point we have 10 Commissioners and Alternates out far more than 30 who have done so. Public shaming will begin in December.

That concludes my report, Chair Wasserman, and I'm happy to answer any questions you may have.

Chair Wasserman asked: Any questions for the Executive Director? (No questions were voiced)

**7. Consideration of Administrative Matters.** Chair Wasserman announced: That brings us to Item 7, Consideration of Administrative Matters. We do not have any administrative listings this time so Brad is easily off the hook and we move on to Item 8.

**8. Briefing on Use of Ocean Protection Council Guidance in Permits.** Chair Wasserman announced: Item 8 is a briefing on Use of Ocean Protection Council Guidance on Rising Sea Level. Erik Buehmann will introduce the briefing. Alternate Commissioner Jenn Eckerle will also present on the issue representing the Ocean Protection Council.

Chief of Federal Consistency and Permits Erik Buehmann presented the following: Over the past seven years since this Commission passed the Climate Change Policy Update your staff has continuously evolved how we approach applying the policies and incorporating the State of California sea level rise guidance. We are always trying to improve how we communicate to you about this complex topic and how we work efficiently with applicants to ensure we are using accurate information and that we are being reasonable, transparent and consistent in how we condition projects or permits.

Since we have new guidance from the state, passed earlier this year, we thought it would be a great opportunity to look at how we have applied these policies and get feedback from you. Jenn Eckerle of the Ocean Protection Council has graciously agreed to present a brief overview of the state's Sea Level Rise Guidance Update. I will do a quick overview of the climate change policies and talk about how we have conditioned projects in the past under the old guidance. Andrea Gaffney, our Bay Development Design Analyst, will then walk through the analysis of a couple of recent projects using the new guidance. It will be pretty exciting, you will get to see under the hood for how we approach these issues in the permitting process and see some of the tools we use in our analysis.

So, I am going to introduce Jenn. Jenn Eckerle is Deputy Director of the California Ocean Protection Council. She is responsible for supervising staff and helping set the strategic priorities for coast and ocean policy in California. Before joining OPC Jenn spent eight years as the Ocean Policy Analyst for the National Resources Defense Council where she conducted technical analysis and developed policy recommendations to advance ocean conservation related to marine protected areas, fisheries, marine debris, desalination, underwater noise, oil drilling and aquaculture. Prior to that she worked as a Coastal Program Analyst for BCDC and the Coastal Commission.

Commissioner Eckerle addressed the Commission: I will put my Deputy Director hat atop my Alternate Commission hat and remind you that several meetings ago our Executive Director Deborah Halberstadt was here to give you a detailed presentation on the update to the state sea level rise guidance so I am not going to go into the details again with you today but just take a few minutes to refresh your memory about the catalyst for and the substance of the updates and then next steps on implementation. Before I move forward, I just want to remind everyone that we have been working really closely with BCDC staff and leadership, not only in the development of the guidance itself but now on next steps for implementation.

A quick reminder on what triggered this update:

There were really two catalysts for this. The first was advances in sea level rise science. There were new modeling techniques and improved understanding of the implications of significant ice melt from the polar ice sheets; and those implications, particularly the amount of the West Antarctic Ice Sheet for the coast of California. Those advances in scientific understanding really merited an update to our sea level rise projections.

Second, this update was triggered by a revised audience. The original guidance was really focused on helping state agencies include sea level rise in their planning and permitting investment decisions. With the passage of an executive order from Governor Brown and two bills that really focused on integrating and insuring that local governments integrate climate adaptation into their planning we now had an audience that was focused not only on state planning but also on local governments.

The guidance really had three main updates: Updated projections based on the best available science; the guidance includes a stepwise approach for evaluating projections, associated risk and needed adaptation pathways; and then recommended adaptation strategies.

I want to talk briefly about the updated projections and then I will go over the other two components.

The 2013 Sea Level Rise Guidance had a set of scenario-based projections. These projections were not fully tied to a specific emission scenario and they did not include a likelihood of occurrence. Additionally, those projections were provided for two regions of the coast, so north of Cape Mendocino and south of Cape Mendocino.

**BCDC MINUTES**  
**November 15, 2018**

The updated guidance now includes probabilistic projections for 12 locations up and down the coast, allowing for more regionally-specific planning. These probabilistic projections associate a likelihood of occurrence with sea level rise and the heights and rates are directly tied to a range of emission scenarios. So, this additional information provides parameters that are critical for decision making under uncertainty.

Additionally, because the probabilistic projections may underestimate the likelihood of extreme sea level rise resulting from that West Antarctic Ice Sheet melt, the new guidance also includes an extreme scenario which is called the H++ Scenario.

As you likely recall from Deborah's presentation, the guidance provides detailed projection tables and directs decision makers to evaluate projects using a range of sea level rise scenarios. Those projections are highlighted as low risk aversion, medium to high risk aversion and extreme risk aversion. Considering a range of different sea level rise scenarios allows for evaluation of vulnerability, understanding of consequences and determining a community's tolerance for risk associated with various decisions.

I just wanted to point out that OPC developed this spectrum for risk analysis and risk aversion to allow for that evaluation, but also because we were really aiming to strike a balance and find that sweet spot by creating a document that would provide meaningful guidance at a statewide level but not being so prescriptive to preclude flexibility for local communities to make decisions based on their needs and their priorities and their tolerance for risk. Additionally, we felt very strongly about providing guidance that allowed for precautionary decisions and didn't allow folks to default to the lowest projection or to allow folks to avoid considering the possibility of that uncertain but physically possible H++ extreme scenario.

So, what you see on the slide now is a risk analysis decision framework that we created to help planners and decision makers walk through this analysis.

The first two steps really help hone in on understanding your location and your time and space constraints and requirements, so we ask planners and decision makers to identify their nearest tide gauge and evaluate the project lifespan. The importance of understanding the project lifespan is through mid-century we are really locked into this high emissions scenario, given that we are really experiencing that based on the emissions in the past. But going forward, if we are optimistic, we still have a chance to turn the tide on our emission scenario, and so there is a possibility that we could trend towards a lower emissions scenario. So, if we have projects that have a lifespan beyond 2050, we have the potential to evaluate not only projections associated with the high levels emissions scenario but also the low.

The third step in this decision framework is to identify the range of sea level rise projections and that is where we get at the low risk, the medium-high risk and the extreme risk aversion. The determination of the risk tolerance is really dependent on the decision maker and the planner and the communities and we, again set that specifically to allow that flexibility and prioritization at a local level.

The fourth step is to evaluate the project impacts and adaptive capacity across a range of sea level rise projections and emission scenarios. This is going to allow for an analysis of what is at stake and the ability of people, natural systems and infrastructure to respond or adapt to rising seas and the economic and social impacts of taking action now versus planning for the future.

And finally, step five really looks at selecting a sea level rise projection based on your risk tolerance and if necessary, using adaptation pathways that increase resilience and include contingency plans. Adaptation pathways provide options for planning and contingencies if sea level rise projections are over or underestimated. So if it is not critical to design a project for the highest level of sea level rise and we are not expecting that every project starting today is going to plan for 10 feet of sea level rise, then we can think about planning for a more moderate level, but build in adaptation measures and pathways so that we can keep in focus the potential of that 10 feet sometime into the future.

The updated guidance also included recommendations for preferred planning and adaptation approaches and we recognize the diversity of communities, uses and natural resources as well as planning for new development versus existing structures may merit different planning approaches.

The new guidance has an emphasis on social equity, public access, living in green infrastructure and the importance of community and regional planning, which I know is near and dear to everyone's heart in this room.

So as far as next steps go, we are continuing to work closely with leadership and staff at BCDC as well as staff and leadership at our sister coastal management agencies to operationalize this guidance and to identify needs and barriers to implementation. We also plan to continue to do outreach to local communities to further understand the barriers and utilize this information to inform OPC's strategic investments around sea level rise adaptation and resilience.

I am really looking forward to hearing staff's presentation today and for the lively discussion that is bound to happen after. Thank you.

Mr. Buehmann continued: So now I am going to do a quick update on the jurisdiction because where a project is in relationship to BCDC's jurisdiction will determine how we apply the climate change policies. I will do a very brief climate change policy review and provide some examples of projects and how we have conditioned those projects in a permit in the past under the old guidance. Then we will get to the fun stuff and Andrea will walk through a couple of projects applying the new guidance - I think they are administrative actions, non-material amendments or administrative permits – and then we will have discussions and questions.

BCDC has lots of different types of jurisdiction and where the project is in relationship to the jurisdiction will determine how we analyze the effect of sea level rise because the Commission's authority is different in the different jurisdictions, the Bay, certain waterways, 100-foot shoreline band, salt ponds, et cetera.

A lot of this will be review for most of you, almost all of you, but it is a nice overview before we go into the climate change policies.

Obviously the McAteer-Petris Act provides for a number of requirements for when you fill in the Bay. Public benefits of the fill must exceed the public detriments of the fill. The fill must be for water-oriented uses, minor fill for shoreline appearance, minor fill for public access, no alternative about the location, minimal fill necessary and minimize harmful effects to the Bay. Importantly for this, the fill must be constructed with sound safety standards. In order to meet that sound safety standards requirement for a Bay fill project the project must be consistent with the Bay Plan policies related to climate change.

In the 100-foot shoreline band BCDC's authority is much more limited. Outside of a priority use area the only reason BCDC can deny a project in the 100-foot shoreline band is if the development fails to provide maximum feasible public access consistent with the project.

The climate change policies were adopted in the Bay Plan in 2011 and we will take a couple of minutes to elaborate on a few of these policies. There are a number of policies in the climate change policies when they were adopted in 2011 including policies that encourage specific types of projects like transportation projects and parks, policies related to the regional adaptation strategy and encouraging the implementation of that and making BCDC a leader in creating that. But I am going to focus on some of the policies we use the most often in regulating projects.

Policy Number 2 states that a larger shoreline project needs a risk assessment conducted by a qualified engineer. A larger shoreline project is not defined in the climate change policies. BCDC staff evaluates each project on a project-by-project basis and determines if it should require a risk assessment.

Risk assessments should use the current 100-year base flood elevation and the best estimate of future sea level rise, use best scientific data and include current and planned flood protection, and depict all kinds of flooding, degrees of uncertainty, consequences of defense failure and risks to habitat from proposed flood protection. The best scientific data and the best estimate of future sea level rise; that is where we incorporate the state guidance. We consider the state guidance to be the best scientific data available to us for projections of sea level rise.

If a risk assessment determines that an area is vulnerable to flooding that threatens public safety the project should be designed to be resilient to mid-century and “resilient” is actually defined in the findings of the Bay Plan policies on climate change. If the project is designed to last beyond mid-century it should be adaptively managed to adapt to future climate change impacts, so adaptive management to end of century. “Adaptation” is also defined in the climate change policy findings, I am not going to read them but they are right there.

As part of the 2011 Climate Change Update BCDC adopted policies in other areas of the Bay Plan, not just the climate change policies; you adopted new public access policies related to sea level rise and flooding from storms. Even before the climate change policies’ update in 2011 public access policies required that whenever public access is provided as a condition of development the access should be permanently guaranteed, which will be relevant to our discussion later on when Andrea walks through some of the policies and talks about public access impacts to flooding.

But the public access policies also provide that public access must be located, designed and managed to avoid flood impacts and any public access provided as a condition of development within the shoreline band should either remain viable in the event of future sea level rise or flooding or equivalent access consistent with the project should be provided nearby.

How we interpret these two policies together, how we determine what “viable” means in this policy is we look to the climate change policies. If you have a larger public access shoreline project, in order for the public access to be viable we look to see if the project will be resilient to mid-century. If that underlying project is going to last beyond mid-century, if its project life is beyond mid-century, then the project should be adaptable to the end of century.

But how we apply these policies will also depend on the Commission’s underlying authority. For a larger Bay fill project in the Bay all these policies could apply and BCDC could ensure resilience of the entire project in the Bay. For a project in the shoreline band, however, BCDC is limited to ensuring that public access is viable in the event of sea level rise and storms.

For example, if you had a residential development project entirely in the shoreline band BCDC could not deny a project on the basis that the development buildings would flood, that the residential buildings would flood. Rather, BCDC would look to the public access and evaluate whether that project failed to achieve maximum feasible public access because the public access was not viable to flood risks or was not safe because the risk of flooding as defined in the policies here.

Other policies that were introduced in the 2011 Update: the Tidal Marsh Policy 6. Tidal marsh restoration projects should be resilient and adaptable to sea level rise and incorporate a buffer that will allow for marsh migration, so it echoes a little bit the climate change policies.



Shoreline Protection should be integrated with current or planned adjacent shoreline protection.

And then the Safety of Fills Policy, the new projects on fill or near the shoreline should be set back or built so the bottom floor is above the 100-year flood elevation that takes future sea level rise into account. Obviously, this photograph does not show those things.

The next two slides are examples of permits you issued that were analyzed prior to the updated guidance. They require risk assessments and adaptation plans.

Treasure Island is the big one. It is a multi-phase master plan for the redevelopment of Treasure Island and Yerba Buena Island into a new mixed-use community. The majority of the project except for some outfalls and a ferry terminal took place either in the 100-foot shoreline band or outside of the Commission's jurisdiction. The Applicant conducted a thorough risk assessment of the public access around the entire perimeter of the island under the old guidance. The permit included a number of conditions related to sea level rise including a threshold for adaptation. It required the development be built to a certain level, to be resilient to sea level rise and then an adaptation threshold and that it also required a monitoring program. So, I am going to walk through those really quickly.

In Phase 1, which you can see is the pink area on this slide; Phase 1 is built to 36 inches above today's 100-year storm, which at the time was the mean, end-of-century projection for the older guidance. The permit included a threshold for adaptation and it is pretty specific. When the mean sea level in the Bay has risen 30 inches above the year 2000 levels, an adaptation planning process will be initiated to adapt the Phase 1 public access. That threshold was chosen to work backwards to provide eight years to plan and construct improvements, adaptation improvements before the actual public access would flood. So, it did not dictate a specific adaptation solution, it did not say 'build a levee' or 'build a wall' but provided instead for a threshold for planning for that adaptation.

Phases 2-4 are built to 16 inches above today's 100-year storm; therefore, they are at risk earlier than Phase 1. Sixteen inches was the mean projection for mid-century under the previous guidance, so this was consistent with the policy in the climate change policies to make the public access resilient to mid-century.

When the mean sea level in the Bay has risen 12 inches above year 2000 levels a planning process will be initiated to adapt Phases 2-4 public access. So, Phases 2-4 will actually have to be adapted earlier. The idea was that obviously new guidance is going to come out, new science is going to come out, how do we incorporate this into this program?

So, the permit requires a monitoring report every five years. The monitoring report includes monitoring of on the ground changes, so actual flooding of the site, ground subsidence at the site. But it also requires an update to the best available science available at the time and whatever new guidance is available at the time, that that be incorporated into this monitoring report. Based on that monitoring report this permit condition could change, the thresholds

## **BCDC MINUTES**

**November 15, 2018**

could change. The risk assessment to the site would have to be changed and future adaptation measures could result from that. So, it sorts of feeds back, it creates an ongoing and science-based approach and adaptation pathway approach to conditioning this project. Every five years you are feeding back into the adaptation plan or the permit to see if it needs to be updated, to see if it needs to be changed based on the best available information at the time.

Treasure Island is unique, it is an island. So, it does not really to worry about linking up to its neighbors; it has a tax base that can fund ongoing monitoring. This is important because there is an issue with creating a specific threshold for adaptation, 16 inches above 2000 mean sea level and you start planning. You cannot necessarily go out on a given day and say, 'Ah, today is the day when 16 inches is clearly above the 2000 levels so now you have got to start your planning process.'

We measure mean sea level on a tidal epoch over 20 years, 5, 10, 20 years. And in order to determine these levels we do a lot of modeling that can be expensive. So, you need to be routinely incorporating this new data into your process and that can be expensive and now every community has the ability to do that. Not every applicant has the ability to do that. We want to provide the flexible adaptation approach that we used with Treasure Island but how do we do it for a different kind of project that does not necessarily have those resources.

Oyster Point Redevelopment Project in South San Francisco, which is an office and R&D development, was permitted in early 2018. The staff reviewed the project under the old guidance but the new guidance was adapted just as the project was coming to the Commission so we did an analysis under both and the public access associated with the project was resilient to mid-century under all scenarios.

For the Oyster Point Redevelopment Project to provide this flexible adaptation pathway approach you do not want to dictate a particular solution because you want to accommodate local prerogatives. Maybe the city is going to have a different plan in the future for how it wants to handle the shoreline, regional efforts. You do not want to leave closed new innovative solutions that we have not even thought of yet and say you are going to build a wall today and in 50 years that does not seem like a good idea. You want to incorporate new guidance and science but we also wanted to craft a condition that was reasonable, enforceable and achievable for the city and the developer.

To condition the project, I call this TI-light. It requires flood reporting, so on the ground conditions, report any closures due to flooding. And then an adaptation plan by December 31, 2050 or when the flooding of the public access due to sea level rise and associated storm events occurs. You prepare a new risk assessment for the public access; incorporate new guidance, analysis of water levels, subsidence, flooding, et cetera. BCDC would review and approve that risk assessment and adaptation approaches might come out of that that may be necessary based on that risk assessment.

We face an uncertain future. So BCDC staff wants to provide you with a broad suite of risk. Different scenarios showing different types of water levels, different storm events. When she walks through the projects with you Andrea will show you one way, we do this in applying the new guidance. The other thing that we have been doing is this adaptation pathway approach to conditioning projects to provide flexibility in the future. So now Andrea is going to walk through some projects.

Bay Development Design Analyst Gaffney presented the following: I am going to quickly run through the first couple of slides because Jenn gave a great introduction to the risk analysis framework.

In applying the guidance going from policy to permits we are going to look at four different projects. Two of them are permitted, one of them is more of a theoretical format for upcoming projects and one is an existing permit that was issued prior to climate change policies.

Once again this is the five steps of the risk analysis framework that Jenn presented so I am not going to explain them to you again; I am just going to show you how we have applied them in the projects.

This first example is a tidal restoration project that was permitted in 2017 prior to the guidance. This is Hill Slough; it is located in the Suisun Marsh. As part of a restoration project 640 acres of marsh will be restored to tidal wetland. In addition to the restoration a regional road will be widened and elevated adding bike lanes and creating public access trails on top of the levees next to the wetland. Even though this project was permitted before the guidance we basically used the same steps so I am going to walk you through those.

Step 1 identify the nearest tidal gauge. To understand the sea level rise applications, we looked for the closest tidal gauge. In this instance it was six miles away so we had to ask the consultants to provide us with best available data.

Step 2, evaluating the project lifespan. Project lifespan for restoration projects is a tricky issue. After establishment they should become operating landscapes that exist in perpetuity with little to no maintenance. They typically have a monitoring plan for five to ten years but then after that they should just be functioning. The project lifespan for the road and the public access trails is more dependent on maintenance but are expected to be there through the end of the century so that was the lifespan that we considered.

Step 3, identifying a range of sea level rise scenarios. We used an early version of the Flood Explorer to look at different flood scenarios for the area. The project outlined in yellow is a low-lying marsh and floods annually with king tides, as you can see from the 12 inches of sea level rise, which represents a king tide. The red lines show where the levees have been overtopped. This is also Grizzly Island Road, so the road does flood at king tides. For this project we are concerned with climate change policies related to the required public access as well as the tidal restoration.

In Step 4, we evaluated the potential impacts and adaptive capacity across a range of sea level rise projections. The project proponents provided a risk assessment with recommended mid-century and end-of-century sea level rise elevations using the best available science at the time. Since we knew that the area already flooded, we wanted to understand what was the resiliency of the proposed improvements with higher elevations for the roads and trails.

To do this analysis we created a spreadsheet to see how proposed elevations would function with these projected sea level rise elevations. At mid-century we knew the road would not flood at mean higher high water but would flood with the 100-year flood, but what about king tides or other more frequent flood events? We built this spreadsheet to understand the nuanced implications of sea level rise to provide us with additional information about the frequency of flooding and at what water elevations we would want to require adaptive management planning.

So here is what we built into the spreadsheet. Up here are the proposed improvements, so you have the road and the Trail elevations. This is the proposed elevation of those improvements. We looked at current water elevations with daily tides and extreme flood events, then we looked at the mid-century tidal regime with the elevation that the consultants provided, and then this section over here is end of century. The blue means the proposed improvement would flood at that water level so, for example, the trail is going to flood at current 100-year flood. It was built to be resilient; it will function after it floods.

We wanted to understand basically when the flooding would start to happen. We knew the state guidance was coming so we built this spreadsheet to have the flexibility to look at these different scenarios.

In Step 5, we select a sea level rise projection based on risk tolerance that is consistent with our laws and policies on resilience and adaptation criteria.

For this project because it is in the marsh, we know that the trails and the roads with required public access will eventually flood. The required public access will likely need to be relocated but there is room to adapt in this landscape. As a result, we wrote the permit conditions to consider a lower risk tolerance knowing that future regional adaptation would be required to address the marsh and the required public access in the marsh.

So, some details about the resiliency and adaptive capacity of this project include the road was designed so that it can be further elevated at a later date and these three water levels represent the current 100-year flood, the mid-century 100-year flood and the end-of-century 100-year flood. So, the road can rise up.

The public access trails which we know will flood with today's 100-year flood were built to be resilient so they have functional capacity designed into them.

The tidal restoration has been designed with shallow slopes. This is the beginning of the tidal restoration on these sides, which the habitat can migrate upland as water levels rise.

There is a flood reporting requirement for closures of the road and trails when flooding causes closures greater than two weeks and adaptation measures for the road and trails must begin when mean high water reaches 30 inches above current levels.

Finally, we recognize that the flooding may result when water levels exceed 16 inches above current levels in the area of Suisun Marsh and Suisun City and cannot be addressed on a project-by-project basis but will require an area-wide adaptation plan. This is a lot of water.

The next project is a shoreline repair project that was administratively issued, a non-material amendment to an existing permit for Cesar Chavez Park in Berkeley.

The project was evaluated with the state guidance. So, for the first steps we located the nearest tidal datum to the project and evaluated the project lifespan.

This is the Park. This white square is pointing out a diamond and that is the tidal datum.

AECOM created a tidal datum with 900 points in the Bay Area so we have very localized, very specific tidal data that we can use to analyze projects.

For this project we considered two factors: The Park is a capped solid-waste landfill that is susceptible to erosion from shoreline flooding and the City is conducting a long-range planning effort for the Park which will address sea level rise and flooding holistically. For these reasons we agreed to the project lifespan of 2050 for the project.

For the next step we used the San Francisco Bay Area table from the state guidance to identify a range of sea level scenarios which range from 11-32 inches for 2050. Like Jenn said, there is only a high emissions scenario for 2050. So, this is the table from the state guidance.

And then the next step was to evaluate potential impacts and adaptive capacity across a range of sea level rise projections. The state guidance recommends considering a variety of social, environmental and economic factors, so the consequence of potential impacts: The capped solid-waste landfill is vulnerable to flooding and erosion from cap overtopping and these create public health and safety exposures from the erosion of the cap.

One of the other questions is: What is at stake? There is the potential closure of the Park, which means a loss of a regional public open space. There is an enforcement and compliance issue with the loss of required public access, not to mention the impacts to the health of the community and the health of the Bay habitat.

With regards to adaptive capacity, there is clearly room to adapt so that is a good thing.

Looking at economic costs or economic impacts: There are costs associated with reconfiguring a landfill to accommodate higher sea level rise. There is potential loss of revenue from events at the Park and the local community and then sort of softer costs in the public health impacts due to potential exposure from the landfill in the event that it does get exposed.

For the next step in the analysis we selected a specific sea level rise projection. Since there is room to adapt a low-risk aversion would be acceptable for required public access and that would be this number right here, which is 1.1 feet. However, the site is a capped solid-waste landfill and the shoreline riprap is there to prevent the erosion of the landfill cap. Overland flooding could potentially impact the safety of the landfill materials and lead to contamination. So, for this reason we found the low-risk aversion scenario to be problematic given public safety impacts from potential exposure so we used the medium to high-risk scenario.

The medium to high-risk scenario for mid-century sea level rise with a time-limited authorization addresses the risk tolerance and allows for future planning for sea level rise adaptation across the entire park site. As you can see in the red lines around the site, there are many locations where the shoreline will be overtopped with 24 inches of sea level rise during a 100-year storm event, which is equivalent to the 2050 100-year storm event.

This next project is an example of a theoretical larger shoreline development project analysis that you can expect to see for several projects upcoming to the Commission in the next year. Ideally the tidal datum is immediately adjacent to the site, which you can see; if this is our theoretical project site, we have got a tidal datum right there. And for the larger shoreline projects the lifespan is typically expected through the end of the century given proposed land uses; that is how they all happen to be.

The next step identifies the range of sea level rise scenarios. With shoreline development we are concerned with mid-century resilience and end-of-century adaptive capacity of the public access that is required as a condition for the development. So, we look at both the high-emission scenario for mid-century and the low and the high-emission scenario for end of century.

For this example, we are going to consider a medium to high-risk aversion because of the limitations of the adaptive capacity of the required public access. A quick reminder, any public access provided as a condition of development in the shoreline band needs to remain viable in the event of future sea level rise or flooding or equivalent access needs to be provided nearby.

Also, another reminder is the shoreline band jurisdiction is not a setback. We allow development in this area but that can impact the adaptive capacity of the required public access, which in turn would require a higher risk aversion. The next few slides are going to look at why we are considering medium to high risk and why we are considering low or high emissions for the end of the century.

This is an updated version of the flood table that we developed for the Hill Slough Project that incorporates the state guidance. We used the spreadsheet in coordination with the Flood Explorer and the tidal datums to understand flooding impacts on future public access by adjusting existing grades to proposed grades to evaluate different project lifespans, risk categories and emission scenarios.

Here is what we built in the spreadsheet: The proposed improvements are still up here and those are the elevations. You still have current tidal and flood event information in this category. This is typically what we use for our mid-century but you can drop down and change the year. This is the project lifespan category. We have variables for emissions and then we have variables for the risk category that are drop-downs.

This is the number associated with the tidal datum from the tidal datum studies. We just enter that in and it populates all of this tidal information here and then it is just math extrapolating across. We added a little more nuance to the blue, so if it is in blue that means it is flooding. We added a gradient to the blue to indicate the depth of flooding, so the number indicates the amount of water in feet that will be covered at that point in time. For this example you can see that the proposed public access is resilient through mid-century and will only begin to flood at the end of century with higher tides, which happen about once a month and that is over here, so right here in this area.

Now I am going to walk you through a series of cross sections of the proposed public access or the theoretical public access to visualize what these numbers look like in a physical landscape. These are typical cross sections that we use for project review in the Design Review Board and the Engineering Criteria Review Board and are also included in the risk assessments for larger shoreline projects.

This is a theoretical cross section of some public access. This public access is on an existing wharf. You can see that there is a structure in the shoreline band area on the right hand side of the slide over here. This is current mean higher high water, that is this dark blue area, and then you have your 100-year flood on top of that in the speckled color.

So, what does that look like at mid-century with a medium to high risk high emissions scenario? You can see the mean higher high water level has gone up a little bit and the 100-year flood begins to impact with water on the underside of the wharf deck. This has maintenance implications with it.

We now jump to end of century. This section shows you the mean higher high water level associated with 5.7 feet of sea level rise. This represents a .5 percent probability that sea level meets or exceeds 5.7 feet above current levels by the end of the century. So, with that in mind we are going to show you a series of scenarios that represent intermittent flooding through the end of century.

This is high water. This happens one to two times a month. This is the higher water when the moon is full and new moon, basically. There will be ponding, maybe a little bit of flooding.

Then you have a 2-year storm, which is relatively common. You will experience flooding over a portion of the public access area so it may be closed while there is water on the deck. These are all above mean higher high water so you have to sort of have the perfect time of day to have the storm hit.

A 10-year flood, you see almost all of the public access has been flooded and so you would have a temporary closure. I can imagine having signage, additional measures to address this.

So, then we go to the 100-year flood. This is a lot of water. All of the public access is under water and the houses might want to think about some sandbags. But we want to be optimistic. We also want to recognize that this is an end-of-century, 1-percent storm on a .5 percent probability and it is also the 2090 scenario for the high emissions. So, this is the low-emissions scenario. This water elevation could happen in the high-emission scenario 10 years earlier, so you would just need to adapt earlier.

This is the high emissions scenario at the end of century. It is a lot of water. We are just going to hope that the science and our construction technologies are going to continue to advance to be able to address this.

This is the last project and I am going to try and fly through this. This is Jack London Square. This was permitted in 1986 with an additional permit added in 2004 to include this hotel project. Both of these permits were issued prior to the climate change policies so there is no language to address resilience or adaptation. However, there is a maintenance condition for the public access in the permit and I am going to read it to you:

“The areas and improvements within the public access area shall be permanently maintained by and at the expense of the permittees or their assignees.”

The hotel development came to the DRB earlier this month and we asked the permittee to consider how the public access could be resilient and adaptable for mid-century and end of century. This is strictly a compliance and enforcement issue from the perspective of the permit but the permittees decided to be proactive in hopefully reducing future costs that would have to be associated with adaptation from a maintenance and compliance perspective. This is what the hotel and the public access are going to look like. It is at the far-east end of Jack London Square, hopefully going under construction next year.

There is a tidal gauge right across the estuary. The project lifespan, end of century; the risk aversion we chose the medium to high risk, again, because there was no equivalent access space to adapt nearby and the maintenance clause in the permit does require the public access to be there.



Again, we applied our spreadsheet and we looked at the different scenarios. We chose the high emissions for this one just to show the worst-case scenario. It is resilient to mid-century; there is minor flooding occurring with storms, and then end of century you have daily flooding.

This is what it looks like in the Flood Explorer. This is the water level that is roughly equivalent to mid-century king tide and you can see there is a little bit of overtopping right there. This is 24 inches of sea level rise at the 100-year storm. Again, the project site is right there and everybody has flooding. It is worth noting that all the adjacent properties also have similar maintenance conditions in their permits for their public access.

So, the project proponents put forward some ideas, some possibilities of how they could adapt in place using berms and seawalls. These are not requirements, we are not holding them to these solutions but these are possibilities. What that would look like in plan view with a series of walls and berms.

So, to build on this issue of maintenance conditions and existing permits and impacts from flooding the planning staff used BayRAT, our internal GIS database viewer, to make rough calculations about the future impacts to shoreline public access across the Bay Area. The purple lines on the map are rough representations of public access related to existing permits and represent approximately 377 miles of access. As a reminder the Bay Trail boasts 500 miles of trails. So, let's look at sea level rise scenarios and see what is flooding.

So, this is current water levels with the king tide and you have 48 miles of flooding.

With 36 inches of sea level rise, which is equivalent to a 50-year storm at current water levels you see 120 miles beginning to flood.

At 66 inches, which is the 100-year storm at mid-century, 258 miles are flooding.

This is the top of our Flood Explorer water level. This is the 100-year storm at the end of century where 331 of the 377 miles are flooding. So, this is a pretty significant compliance and enforcement issue that is coming up.

The next slide is really talking about Assembly Bill 2800 which has just done a study on pathways for a climate safe infrastructure and as part of this they have made recommendations on establishing criteria for adaptation thresholds and safety. How much water is safe to have on a public access area? What are design elements that can be used to adapt these areas? Things like that. There are currently really no criteria to establish when a frequency of flooding is too much and what sort of adaptation measures need to happen. I am glad that we have this but this is basically saying we need to develop the criteria.

We just want to end up with a series of questions that staff has been discussing and get your comments and questions.

Chair Wasserman announced: I will entertain a few questions. We do not have time to do the full discussion that this deserves, and which it will have, but not until early next year; but if anybody has a particularly burning or salient comment or question?

Commissioner Gorin commented: This is a really great analysis, thank you so much for sharing this. It really reinforces how difficult our jobs are on BCDC to protect the public spaces. We always knew that the public spaces were going to be at risk with sea level rise, the Bay level rise.

The question that I have for you is that it potentially will create more conflicts with our applicants because they will want to maximize the development on the land and potential profits while we are going to want to maximize the amount of land and all of the protections that they will need to build in to elevate the public spaces or protect the public spaces because retrofitting it is not an option. Those public spaces are going to be under water. I am sure that you have thought about this and I am sure that we all are thinking about this; I do not know that there are any solutions going forward but I want to acknowledge that this is going to be the tension on the part of all of us.

Mr. McCrea replied: There is an inherent intention between the knowledge base we have now, what we know, what we don't know, building for the future but not knowing what the future will bring.

We asked one of our developers to join us today, he is in the room, Bill Kennedy from Catellus is here, and through the Chair, if I might, invite Bill to speak, he would like to speak as a member of the public if that is okay?

Chair Wasserman answered: It is.

Mr. Kennedy addressed the Commission: My name is Bill Kennedy and I am with Catellus Development. Many of the folks in this room might know Catellus for our history in San Francisco. We were the original owner and developer of Mission Bay; we are no longer part of that project.

We have done a considerable amount of work within the Bay Area around the Bay. One of our large projects is in Fremont, California, where I was personally involved in developing 440 acres of wetland restoration that we then deeded back to the federal Fish and Wildlife Service, which to this day very infrequently sees water but I am sure it will in the future.

The Catellus model, maybe we are not a typical developer. We partner with cities. It is in our best interest to come up with development agreements where - it might sound cliché – but where the developer and our partner, usually a city or municipality, come out ahead; we all get something out of it. We are a local developer, we want to be here, we want to be well-respected in the community and we want to build projects that people like to come to and enjoy. We are not a merchant builder. We are in it for the long haul.

Brad had asked if I could come and speak for about three minutes on sea level rise. I cannot explain sea level rise to our principals in three minutes but I am going to do the best that I can here real quick.

We do other projects around the Bay. We have hypothetical projects that are on the plate all the time. One such project is very similar to some things we have been looking at tonight where our conditions of approval listed that we deal with sea level rise, now and in the future. So, we went to work with our engineer to try to figure out what that meant and just a real quick run-through of what we went through and I assume it is typical.

We had to figure out what is the target? What are we trying to achieve and what are we trying to overcome in terms of predictions of sea level rise?

There is another large project in Alameda down at Alameda Point where they had gone through a very similar exercise and had come up with the city, I believe, had established a criteria of set your base elevation, take your mean higher high water, add 24 inches of sea level rise for mid-century, 12 inches of free board to get to 36 inches, and that should be your mid-century criteria. End of century we have all heard this 66 inches and that has sort of been the general consensus.

I asked our engineer where that came from and he pointed me to some existing guidance and some documentation and after a couple of days of working with him this is what we came up with and this is what our research was based on, these publication bodies and working groups: The Ocean Protection Council, the OPC Science Advisory Team, the Ocean Science Trust, the IPCC, the National Research Council (NRC), the California Natural Resource Agency (NRA), Coastal and Ocean Working Group Climate Action Team (COWGCAT) and National Academy of Sciences. These all sound like very great resources and we spent a lot of time reading what they all had to say. That is where we sort of established and justified this 24 inches plus 12 inches mid-century and 66 for end of century.

Then we started working with staff and they said, 'Well, you need to be looking at the OPCC most recent guidance, the 2018 update.' I asked Andrea to put this slide up here, this one will work. We fall into the category at mid-century of 1.9 feet, so that roughly coincides with the 24 inches so we are okay mid-century, we did not seem to have much trouble with that. But what caught my attention, and this is something I want to point out, we have had a lot of internal discussion about it, if you look at the top of the categories in the guidance under Likely Range; that is sort of where we go to for mid-century. Depending on whether you are looking at a high-emissions or low-emissions scenario, that mid-century could occur in our instance in 2050 or 2070. But what I was interested in was at the top it says 66% probability sea level rise is in-between these two numbers. Okay, that is a pretty reasonable, safe bet that we should work to that. It coincides with the 24 inches we had talked about, it works mid-century and we do not have a problem with that.

I wanted to touch on one thing before I started getting into the table and that was the input variables here and you have seen the slide a couple of times. The steps that we went through to define what the risk category is. In our view we are trying to figure out what the risk profile is and what the probability of a consequence is. That is really what this is all about.

So, Step 1, identify the nearest tide gauge; we had done that.

Step 2 evaluate the project lifespan. I have seen buildings that have been around for 100 years, 200 years. I asked a lot of builders, 'How long is your building supposed to last?' 'It depends how well you take care of it.' And that is so true.

Our project, as many that you will see, incorporates some existing, in some cases historic or relevant past structures, concrete wharfs. In our early analysis of what to do with this one project we determined pretty early that to demolish the wharf over the existing water and remove it and replace it with something that would provide some level of value to help pay for the rest of the development was just infeasible.

So, the natural inclination was, let's use this, let's use it and bring some of the history forward. But we quickly found ourselves faced with the potential liability of now we have to guarantee the life of this thing. So, what the lifespan is for the existing improvements is kind of as long as it lasts and then we do some analysis to predict what that might be. But at any rate we set, for reasons that Andrea presented, we set the lifespan at 100 years and that immediately takes you to the second part of the table.

This is the last point I really wanted to make that I think you should consider – we have seen these colored slides before that show the dark blue line, the different scenarios. And I have asked staff, 'Can you get a lighter shade of blue? I need a really, really light shade of blue.' Because when I look across at this second category here – and staff made a good point of pointing that out – it says .5 percent probability that sea level rise will meet or exceed these levels. We put on top of that a 100-year flood event which is a .1 percent probability and then we draw these blue lines that show what will happen.

If you look at the risk curve in the guidance and the documents that flow into advising the guidance, we have all seen them, there is a very tight set of these probabilistic projections that get you through mid-century. Everybody can generally agree on that but after that they vary wildly. Even in the last two weeks we have heard all sorts of things in the news about there is a big mistake in those curves, it is much worse. Well no, it is not much worse; they actually made a mistake in the calculation. Well, yes, they admitted it but it is actually right back to where we thought we were. It just accentuates the fact that .5 percent probability means something.

Our view is we cannot tell what types of adaptive measures we might need until we are closer to that point in time. Our approach has been, let's do some level of adaptive measures that are feasible – and again we had to define what "maximum" means, what "feasible" means, and I did see a definition today of "public access" – but we need to get to

## **BCDC MINUTES**

**November 15, 2018**

some level where we can come up with some feasible in the current project whatever adaptive measures could be put in today with the ability to look to the future down the road when technology is improved, all of our neighbors have done whatever they are going to do so that they are managing their overtopping. We get together, we talk to our partners the cities to see what their master plan might be and then we adapt it. Then we bring in some future corrective measure, adaptive measure.

I just want to point that out. There is a lot of subjectivity in the target we are trying to hit but we get the intent. We want a long lasting project but what good is it if we are the only project standing and everything else is underwater or collapsed through earthquake or whatever it is going to be. Just thought I would add a little bit of practicality.

Chair Wasserman added: That is an excellent point to end the discussion. Let's call it a cliffhanger. When it comes back early next year, we will allow a significant amount of time to discuss it, we will have a brief summary recap of what mostly the questions are and to focus our attention.

Commissioner Eckerle commented: I am looking forward to the more in-depth discussion next year. I just wanted to say thank you to the staff. We did a lot of work synthesizing the state of the science to get the science foundation. We did a lot of policy thinking around developing this guidance, but the work that you have seen today that has been presented by staff is incredibly sophisticated and they are really pioneering the implementation and the operationalizing of this guidance. So, I just wanted to say, thank you guys and the work that you have done is really going to serve as a model for implementation across the state.

**9. Briefing on Fill for Habitat Bay Plan Amendment.** Chair Wasserman announced: That brings us to Item 9, the much anticipated background information for our briefing on the Bay amendment to address Bay fill for habitat projects. Shannon Fiala and Megan Hall will provide the briefing.

Planning Manager Fiala presented the following: I am Shannon Fiala. I am the Planning Manager at BCDC. You hear often how small we are. I am supervising the work of three staff who are handling all of BCDC's current policy updates including two Bay Plan amendments as well as a San Francisco Waterfront Special Area Plan amendment that was requested by the Port and a recently requested update to the Solano County component of the Suisun Marsh Local Protection Program.

I just want to give you a very brief history of how we initiated this Bay Plan Amendment.

As some of you may recall, the last Bay Plan Amendment that BCDC approved was the Bay Plan Amendment to add climate change policies. That was approved in 2011 after three years of hearings.

In 2013 Chair Wasserman created an informal Commissioner working group to try to further strengthen the Commission's expertise on rising sea level. One of the many recommendations that came out of that working group was to form a more specific Commissioner working group focused on how and whether to amend BCDC's law and policies further to adapt to rising sea level, focused on Bay fill policies.

The Bay Fill Policies Working Group was formed in 2014 and continues to meet. It was meeting from 2014 to 2016 and was staffed largely by our regulatory division.

Around 2015 the planning side of BCDC actually was awarded a NOAA Project of Special Merit to pursue a project that was referred to as Policies for a Rising Bay, which was asking a similar question of how we could amend BCDC's law and policies to adapt to rising sea level, but driven largely by an external steering committee comprised of folks from the public sector, private sector and advocacy organizations.

Those two processes converged in 2016 with a series of public workshops with our Commission that ultimately amounted to 10 public workshops between 2016 and 2017 that resulted in the adoption of eight Adaptation Actions including the creation of our Regional Adaptation Plan, the creation of an education campaign to raise awareness about rising sea level as well as updating BCDC's law, regulation and policies to further adapt to rising sea level.

In June of 2017 staff provided a more in-depth exploration of how we could and should update BCDC's legislation and Bay Plan and how we could develop guidance documents to further that goal of adapting to rising sea level.

Ultimately in July of 2017 the Commission prioritized and initiated two Bay Plan amendments, the Bay Plan amendment to incorporate policies on social equity and environmental justice as well as the Bay Plan amendment that we will be discussing today to analyze Bay Plan policies that address Bay fill affecting habitat restoration projects.

Just to acknowledge the timeline question of what has staff been up to since July of 2017 when this amendment was initiated?

As you may know or you may have pieced together, the Planning Division at BCDC has experienced a lot of staff turnover since then. Lindy Lowe left to join the Port. I started in December of 2017 and began working with Isaac Pearlman who was the project manager on this project; unfortunately, Isaac decided to leave BCDC in May of 2017. We are very pleased to have finally found Megan Hall, who is the new project manager on this project. She joined BCDC in August. So, I will turn it over to Megan to go into project process and next steps.

Planner Megan Hall addressed the Commission: Thank you Shannon for that general background and introduction. Thank you, Chair Wasserman, and thank you to the Commission for having us present on this today.

The much-awaited process and timeline: I am going to talk through this, hitting on mostly the main points.

**BCDC MINUTES**  
**November 15, 2018**

Essentially, as Shannon mentioned, we have had staff turnover. Scoping and organizing of this project did already mostly happen earlier this year. We are at the tail end of that phase now and transitioning into the background research phase. That is going to include reading past permit approvals, looking into scientific literature, doing informational interviews with relevant stakeholders, et cetera.

We expect that to continue into the early spring, at which point we are planning to hold a couple of public workshops in February and March of 2019. One of these would likely be a Commission workshop and the other would likely be a more science-focused workshop. Please stay tuned for the exact subject matter and days of those workshops.

From there we will take the material we have gathered through the background research phase and the public workshops to actually begin drafting policy changes, which will be an iterative process including our project team and staff, especially working with BCDC regulatory staff to make sure that all of this information is going to be useful to them in writing future permits, as well as collaborating with our Bay Fill Policies Working Group.

Ultimately, we hope to get our first draft of the staff report to the Commission and ready for a public hearing by June 20th of 2019. This is the main updated date that you all may have seen in the new brief descriptive notice that was sent out a couple of weeks ago.

From there, as I am sure you all know, having only one public hearing is optimistic so we may have to have others and we are happy to do that depending on the feedback that we get. If we do end up only having one public hearing we could get to final action by August or September of 2019, which would place us at completion of state and federal administrative law review around the end of next year. But that all may shift depending on the number of public hearings that we do have.

Now I am going to get into some of the more specific issues associated with the project and just a little bit of context that is specific to the Fill for Habitat Amendment.

Really the key issue at the heart of this is that adaptation to sea level rise may require more fill for certain habitat projects than our policies currently allow for. So essentially, as I am sure most of you know, when BCDC was created in 1965 the Bay was being threatened by excess fill, so our policies were written to safeguard against that issue. However, enter sea level rise. When this became an issue and came on the scene there is now the reverse threat where you actually have the challenge that coastal communities and coastal ecosystems and tidal habitats could now actually be flooded and may need more fill in order to keep pace with sea level rise. For that reason, we are looking into our Fill for Habitat policies as there is this sort of pivot in our main priorities.

I do want to note that right now actually our policies have not really prohibited any kind of work with fill from happening in the Bay and that is because most restoration work happens behind levees in diked wetlands, so that kind of work right now does not have excessive restrictions on the amount of fill that you are able to use. It is more of the fill that is placed directly in the Bay that is an issue, but we will likely need to be placing more fill directly in the Bay as we are helping wetlands and other habitats keep pace with sea level rise.

Just a brief overview of our project goal: This was also something that came out of the scoping phase of the project. We are seeking to amend the San Francisco Bay Plan to address the planning, design and permitting of necessary Bay fill for habitat projects in the San Francisco Bay, and to increase the region's resilience to rising seas using the best available science. So, the main thing to note here is that "habitat projects" is in bold and essentially, we did more or less decide that projects where habitat restoration is the primary focus should be the focus of this amendment as opposed to projects where shoreline protection is the primary focus. However, we do recognize that this is a very blurry line and that many habitat projects do include lots of wonderful shoreline protection benefits as well and so we are working on the details of how exactly to parse out those two things right now.

This is a brief overview of the relevant Bay Plan policy sections that we are actually going to be addressing. These were identified in the brief descriptive notice and essentially a summary of those, the first three are all part of our natural resource policies. Then as you move into the other policies, we get Dredging policies, Protection of Shorelines and, note, potentially Public Access, which I'll address at the end of the presentation.

The first of these major issues of the policy challenges that we are trying to address here that led to the selection of those policy sections that I just showed you; is how to handle this term "minor amount of fill?" Right now, in those three natural resource policy sections restoration projects are restricted to only using a minor amount of fill in the Bay when they are going to be doing a habitat restoration project. Now this is different than what our law requires for all projects in general which is that the minimum amount necessary for the successful completion of a project should be used, so "minor amount of fill" applies an extra layer there.

Again, I did really want to highlight the fact that this is specifically for fill in the Bay so it has not been a restriction for those big wetland restoration projects that have already happened like Sears Point, Hamilton Wetlands, et cetera. But in the future, as we are trying to adaptively manage wetlands, potentially doing new strategies such as thin layer placement, et cetera, this "minor amount of fill" term could become problematic.

In a similar vein, our dredging policies state that we should not use more than a minor amount of dredge material. This is placing a limit similarly on beneficial reuse of dredge material; that ties in with the Oakland Middle Harbor Enhancement Project that Brenda was just talking about. This policy could also be somewhat problematic in the future as we try to adapt to sea level rise because basically beneficial reuse of dredge material is one of the essential and probably the predominant source of sediment that we would be using in this type

## **BCDC MINUTES**

**November 15, 2018**



of project as we do adapt to sea level rise. So, making sure that we can use as much as would potentially be necessary is important, however, I think as Commissioner Nelson noted, this is a tricky line to walk as there are other considerations. But this is something we will certainly be discussing.

Moving on to the next slide, this is a topic that we could potentially supplement to make our policy stronger: how we could provide additional guidance on specific habitat types that will be more and more prominent as sea level rise progresses. So, this includes things like transition zones and oyster reefs which are right now done to some extent in the Bay but are going to become increasingly essential as sea level rises. Right now, there is a lot of question as to where these types of habitat features would be best added, what sort of restrictions should be placed on them, how do you consider the balance of habitat lost with that of habitat gained, et cetera. This is another thing we will be investigating.

Finally, the question of how to deal with uncertainty in habitat projects. Right now, as I mentioned, there are a lot of thoughts toward newer techniques being used in the Bay such as thin layer placement, et cetera, and a lot of these things have not really been tested in the Bay before. But doing them at some level will be important in order to make sure that we are adapting to sea level rise so we need to make sure that we are capable of permitting this kind of project, pilot projects or those with higher levels of uncertainty, and that we are encouraging those kinds of projects to make sure that we are moving things along in the right direction.

Finally, I get to public access. As you will remember when I showed you the list of policy sections identified in the brief descriptive notice, Public Access was listed as a potential component of this amendment.

The reason for that is when this amendment was first being discussed as part of the public workshops on sea level rise hosted by the Commission, public access was not really a component that was raised that was specifically affiliated with the fill for habitat issue.

However, toward the end of those workshops one of the attendees raised the issue of public access conflicts with wildlife and how rising sea level would intensify the competition for already limited space there. For that reason, public access was added in as a potential component of this amendment.

However as staff and the Bay Fill Policies Working Group have been discussing where exactly this piece fits in to the fill for habitat discussion we have realized that it does not necessarily fit specifically into fill for habitat because public access and the effects of sea level rise on public access, as we heard so much about in the presentation immediately before this, are much bigger issues and they are issues that really do need to be discussed comprehensively and have all the proper voices in the room when we are having those discussions.

So, we could potentially break off a tiny piece of public access and address it in terms of restoration projects or fill for habitat projects but I think there are a lot of commonalities with other issues that we would be missing there. For that reason, the staff and the Bay Fill Policies Working Group have come to the conclusion that it would be best to separate out the public access component and make it its own separate amendment. This is the first time you all are hearing this so I would like to hear your feedback on that as well if we have time or at a later date as well. But that is our thought right now.

We have not picked a place of where exactly in the chronology of these future amendments this would fall but we anticipate that it would be ideally in the next several years. And that is, again, something that I think we need to discuss in more detail with the Commission about how exactly this would play into the overall timeline of our upcoming amendments.

With that I will wrap it up and turn it over to Commissioner Nelson for further comment.

Commissioner Nelson commented: I just want to note that since I was last before you, back now as an alternate for Sanjay Ranchod, since I was last before you, we have three new staff working on that issue, Megan, Shannon and Jessica Fain. That is one of the reasons the timeline to work on this project has been slower than we had originally planned. But I am really excited. The Sea Level Rise Working Group met just before this meeting and we are now in what I see as the really meaty part of this conversation.

I just wanted to mention three things about process and then Jim is going to talk a little bit about substance.

First, we have spent an enormous amount of time getting to the point we are at. We have had, I am not sure exactly how many, but we have had a lot of presentations to our working group from a variety of stakeholders talking about some of the examples of challenges we are likely to be seeing with regard to sea level rise and a range of issues. We have done that work between 2014 and early 2018 and we are now just meeting again and starting to dive into the details of policy recommendations.

Second, as I mentioned, the timeline is longer than we had originally planned and there are two comments I wanted to make about that: The first is that one of the reasons it is taking us some time to do this work is that the Commission is really blazing a new path here. We are not following the work of half a dozen coastal agencies around the country. This is a place where BCDC really is blazing a new path and it is taking us some time to do that work carefully and thoughtfully.

I mentioned staff turnover; I want to talk about the plus side of that. One of the reasons we have had to hire new staff is that because we have been doing such innovative work our previous staff was poached by others to help them do adaptation work. So that, I suppose, is a tribute to the work we have been doing, nevertheless it affects our timeline.

## **BCDC MINUTES**

**November 15, 2018**

But more importantly, the discussion about how we tackle these Bay Plan amendments - right now we are talking about six or seven separate Bay Plan amendment processes that we are going to go through – is a delicate balancing act. On the one hand there is overlap among every one of the Bay Plan amendment policies that we are discussing, so you can easily justify the idea of doing all of these Bay Plan amendments all at once. Larry does not seem to think that is a great idea. We cannot have our staff do all of those amendments all at once, despite the fact that there is overlap between most of the policies we are considering.

And there is a tradeoff, the more time we take on policy one the longer we push off policy number two. We had a discussion at the Bay Fill Working Group today and that discussion is going to continue about how to properly phase these issues, about how to handle an issue like public access. Maybe we should handle some of it in habitat. But there are clearly some other issues that are well outside that issue. So, we would welcome your thoughts about those issues.

Our working group discussion this morning was primarily focused on timeline and process, our working group meeting on December 20th is going to dive much more deeply into the nuts and bolts of the actual policy decisions we have to wrestle with. Things like, what do we do with Dredge Fill Policy 11 and some of the other policies that Megan just walked us through. That's an overview of where we are in terms of process from the working group perspective.

I should also mention that the working group is eager for us to keep making progress as fast as I can so they gave me direction to talk with staff and Larry and Zach about our opportunities to be creative and accelerate this incredibly important work. We all know we want to do that.

So enough about process; I will now hand it off to Jim who will talk about a couple of examples of specific projects where these are not theoretical concerns.

Commissioner McGrath addressed the Commission: I am going to start by telling that my dear friend Phyllis Faber has threatened to come back and haunt me if I don't finish this before she dies. Phyllis is truly my oldest mentor about preservation and enhancement of wetlands and continues to be. I wanted to paraphrase Santayana here and say there is some benefit to studying history.

I promise not to give you spreadsheets, dates, cross-sections, just kind of pretty pictures. What I am going to try to show you is the genesis of this little marsh here, which is an accident. What you have in these slides are courtesy of Julie Beagle in the Resilient Landscape Program at the Estuary Institute.

This is the historic shoreline back here with mud flats and you can see the fill for the Port of Oakland, the Bay Bridge and the like. But in the middle of this, in what used to be mud flats, you now have a marsh that provides habitat for the Ridgway's rail. So, I am just going to toggle back so you can see that this zeroes in on this area, which was not actually tidal wetlands.

So, this is an aerial photo sometime in the 1920s I was not sure of the date. You can see that that marsh does not exist but fill is actively going on at the Port of Oakland here. This is Middle Harbor and part of the reason that I got the idea. You can also see the fill going on in what was the Naval Air Station. This is fairly typical; material was just dumped over the side. Here where the object was to create a wharf, you can see a containment structure.

This is a map. This date is wrong. It is actually probably about 1928. This is before the construction of the Bay Bridge, which was completed in about 1932. What I want to show you here is there is a little dredge material disposal going on. So that marsh that we saw accidentally was created by that unconfined material and material that was side-cast from the Bay Bridge construction, reworked itself into this dandy little marsh. It has taught us that marshes will form where tidal conditions are right and there is ample sediment. Not without consequences.

I am going to show you three slides on Sonoma Creek with a take-home message up there as well.

This is the 1915 survey. There are a couple of interesting things for those of you interested in Highway 37. It was located on this wave terrace, perhaps not the most resilient place to have located a highway. You can also see that this system is tied up to the marshes back here, which is a very important factor.

This is a current Google Earth map. You can see these broad marshes in there. There are two causes for that. On this marsh, which is huge, this distance is about a half-mile. If you go down here to the Napa River, which I can see more clearly here, there is a long jetty which is a navigational jetty. Between that jetty and the material that was washed into the Bay from Gold Rush mining these marshes accreted very rapidly. But you can also see something else that is very important. They have no circulation channels of any appreciable size. They have substantial habitat value but they do not have the kind of circulation of a natural marsh.

We learned from that and from Phyllis' work and you can see that in the restoration marshes at Sonoma Baylands and at Sears Point those channels have been created.

Now the final picture: This is the take-home message. This is from 1993. This channel has continued to narrow. But if you toggle back and forth and think that if you go all the way back to this, these land forms are largely stable. But all this has accreted in-between, which means the water that was pushed by the tides in and out is no longer pushing in and out. All this has accreted and that exacerbates flooding radically in Sonoma Creek.

So, the take-home message on that is we need to do things on a landscape scale that reflect those goals. Sonoma Creek is particularly important to me because it is a steelhead stream. You can provide better wildlife habitat, better resilience and better flood control but you need to think of it in terms of landscape.

Those are my take-home messages, thank you.

Chair Wasserman continued: We are not going to be able to discuss this further either today. It is going to come back. We did warn you this was a jam-packed agenda and we have had to compress some things. We want to get this information out.

One of the lessons that the Commission and staff have learned and succeeded at is that these major issues require more public discussion and sometimes that means not all at once. So that is why we are truncating the discussion. We will come back to it.

But I do want to take the prerogative of one comment. I very much appreciate the cautious words that were used in talking about the Bay Fill Amendment. There is no question that this Commission conceptually has understood, we have pivoted; we will need to fill the Bay to save the Bay. The purpose of the amendment is to, as has been pointed out, deal with some of the difficult balances and figure out how we do it and give us the full legal basis for doing that. But we have turned that corner and we have said so in a range of discussions and in fact in our action plan. The process continues to be very important.

So, with that, I would entertain a motion to adjourn.

**10. Adjournment.** Upon motion by Vice Chair Halsted, seconded by Commissioner Nelson, the Commission meeting was adjourned at 3:25 p.m.